

What is claimed is:

1. A nonvolatile solid-state magnetic memory comprising a recording layer made of carrier induced ferromagnetic material.
2. The nonvolatile solid-state magnetic memory as defined in claim 1, wherein said carrier induced ferromagnetic material is carrier induced ferromagnetic semiconductor.
3. The nonvolatile solid-state magnetic memory as defined in claim 2, wherein said carrier induced ferromagnetic semiconductor is at least one of (Ga, Mn)As and (In, Mn)As.
4. The nonvolatile solid-state magnetic memory as defined in claim 1, wherein the carrier concentration of said recording layer is controlled.
5. The nonvolatile solid-state magnetic memory as defined in claim 4, wherein said recording layer is formed above a given substrate, and a metallic electrode layer is formed above said recording layer via an insulating layer.
6. The nonvolatile solid-state magnetic memory as defined in claim 5, wherein a given buffer layer is formed between said substrate and said recording layer.
7. The nonvolatile solid-state magnetic memory as defined in claim 5, wherein said recording layer functions as a channel layer.
8. The nonvolatile solid-state magnetic memory as defined in claim 7, wherein said metallic electrode layer functions as a gate electrode.
9. The nonvolatile solid-state magnetic memory as defined in claim 1, wherein the thickness of said recording layer is set within 0.3-200nm.
10. The nonvolatile solid-state magnetic memory as defined in claim 3, wherein said substrate is made of GaAs.
11. A method for controlling the coercive force of a nonvolatile solid-state magnetic memory with a recording layer made of carrier induced ferromagnetic material, comprising the step of applying a given electric field to said recording layer so that the hole carrier concentration of said recording layer is reduced during recording.
12. The controlling method of coercive force as defined in claim 11, wherein said carrier induced ferromagnetic material is carrier induced

ferromagnetic semiconductor.

13. The controlling method of coercive force as defined in claim 12, wherein said carrier induced ferromagnetic semiconductor is at least one of (Ga, Mn)As and (In, Mn)As.

14. The controlling method of coercive force as defined in claim 11, wherein the thickness of said recording layer is set within 0.3-200nm.

15. The controlling method of coercive force as defined in claim 11, wherein the intensity of said electric field is set within 0.01-10MV/cm.

16. The controlling method of coercive force as defined in claim 11, wherein the carrier concentration of said recording layer is controlled.

17. The controlling method of coercive force as defined in claim 16, wherein said nonvolatile solid-state magnetic memory includes a given substrate to support said recording layer and a metallic electrode layer provided above said recording layer via said insulating layer, thereby to complete an electric field effect transistor, and said recording layer functions as a channel layer and said metallic electrode layer functions as a gate electrode, whereby said electric field is applied to said recording layer via said metallic electrode layer.

18. The controlling method of coercive force as defined in claim 17, wherein said nonvolatile solid-state magnetic memory includes a buffer layer between said substrate and said recording layer.

19. The controlling method of coercive force as defined in claim 13, wherein said substrate is made of GaAs.

20. A method for recording in a nonvolatile solid-state magnetic memory with a recording layer made of carrier induced ferromagnetic material, comprising the steps of:

placing said nonvolatile solid-state magnetic memory under an external magnetic field to apply a given magnetic field of inversion to said recording layer, and

applying a given electric field to said recording layer under said magnetic field of inversion so that the hole carrier concentration of said recording layer can be reduced, to invert the magnetization of said recording layer and thus, perform recording operation for said nonvolatile solid-state magnetic memory.

21. The recording method of nonvolatile solid-state magnetic memory as

defined in claim 20, wherein said carrier induced ferromagnetic material is carrier induced ferromagnetic semiconductor.

22. The recording method of nonvolatile solid-state magnetic memory as defined in claim 21, wherein said carrier induced ferromagnetic semiconductor is at least one of (Ga, Mn)As and (In, Mn)As.

23. The recording method of nonvolatile solid-state magnetic memory as defined in claim 20, wherein the thickness of said recording layer is set within 0.3-200nm.

24. The recording method of nonvolatile solid-state magnetic memory as defined in claim 20, wherein the intensity of said electric field is set within 0.01-10MV/cm.

25. The recording method of nonvolatile solid-state magnetic memory as defined in claim 20, wherein the carrier concentration of said recording layer is controlled.

26. The recording method of nonvolatile solid-state magnetic memory as defined in claim 25, wherein said nonvolatile solid-state magnetic memory includes a given substrate to support said recording layer and a metallic electrode layer provided above said recording layer via said insulating layer, thereby to complete an electric field effect transistor, and said recording layer functions as a channel layer and said metallic electrode layer functions as a gate electrode, whereby said electric field is applied to said recording layer via said metallic electrode layer.

27. The recording method of nonvolatile solid-state magnetic memory as defined in claim 26, wherein said nonvolatile solid-state magnetic memory includes a buffer layer between said substrate and said recording layer.

28. The recording method of nonvolatile solid-state magnetic memory as defined in claim 22, wherein said substrate is made of GaAs.

29. The recording method of nonvolatile solid-state magnetic memory as defined in claim 22, wherein the intensity of said external magnetic field is set within 0.1-100mT.